

NOTES FROM THE HERBARIUM OF THE UNIVERSITY OF WISCONSIN—II.

BIDENS CONNATA AND ITS VARIETIES IN WISCONSIN

NORMAN C. FASSETT

(Plate 160)

IN his key to the northeastern American species of *Bidens*¹ the writer distinguished *Bidens connata* and its allies, *B. bidentoides*, *B. Eatoni*, *B. multiceps*, and *B. heterodoxa*, as having the "margins of the achenes antrorsely barbed, at least at the very base." Some of the achenes do not show this. A more constant character seems to be in the hairs on the surfaces of the achene, which are antrorse, as opposed to the retrorse hairs (or none) on the surfaces of the achenes of *B. laevis*, *B. cernua*, *B. hyperborea*, *B. comosa*, and *B. tripartita*.

The following arrangement of the variations of *Bidens connata* is based on material in the Herbarium of the University of Wisconsin, on the collections of L. M. Umbach recently acquired from North-Central College, material from the Milwaukee Public Museum made available through the courtesy of Dr. H. H. Smith, and material of *B. connata*, var. *pinnata*, kindly loaned from the Herbarium of the University of Minnesota by Professor C. O. Rosendahl.

As it grows in Wisconsin *B. connata* falls into six varieties, as follows:

- a. Middle and lower leaves undivided, from coarsely dentate to deeply cleft into 3 broadly lanceolate divisions—*b*.
- b*. Margins of achenes retrorsely barbed, except sometimes at base—*c*.
- c*. Petioles winged: achenes seldom exceeding 6.5 mm. in length: leaves often 3-cleft—*d*.
- d*. Outer involucrel bracts seldom exceeding 1.5 cm. in length. var. *typica*
- d*. Outer involucrel bracts 3–6 cm. in length. var. *fallax*
- c*. Petioles narrowly margined: inner achenes 7–8 mm. long: leaves rarely 2–3-cleft. var. *petiolata*
- b*. Margins of achenes with at least some antrorse barbs toward the summit—*e*.
- e*. Awns with antrorse and retrorse barbs intermixed. . . . var. *ambiversa*
- e*. Awns entirely antrorsely barbed. var. *anomala*
- a. Middle and lower leaves pinnately 3–7-parted, the divisions narrowly lanceolate. var. *pinnata*

B. CONNATA, var. *typica*. *B. connata* Muhl. in Willd. Sp. iii. 1718 (1804); Fernald, RHODORA x. 200 (1908); not Farwell, Ann. Rep. Comm. Parks & Boulevards Detroit xi. 91 (1900). Following Nuttall, Professor Fernald distinguished *B. connata* from its var. *petiolata* on

¹ RHODORA xxvii 184–185 (1925).

the basis of the winged petioles and lobed leaves of the former. Some years later, in RHODORA xvii. 243 (1915), R. W. Woodward pointed out the fact that the achene of var. *petiolata* is larger than that of typical *B. connata*. This achene difference was again emphasized by Fernald in RHODORA xxi. 103 (1919) by the statement that *B. connata* has outer achenes 4–5.3 mm. long, and inner achenes 5–6.5 mm. long, while its variety has outer achenes 6.5 mm. long, and inner achenes up to 8 mm. long.

A number of plants in the Herbarium of the University of Wisconsin have unlobed leaves and short achenes. A study in the field revealed, on the sandy shore of Golden Lake, near Dousman, Wisconsin, plants (Fig. 2) which are almost a perfect match for the material of typical *B. connata* collected by Fernald & Weatherby at Winchester, Massachusetts, in September, 1908, and distributed as *Plantae Exsiccatae Grayanae* no. 298. Growing with this form at Dousman, and obviously grading into it, was a plant also with short achenes, but with unlobed leaves and winged petioles (Fig. 1). It appears, then, that var. *typica* may have uncleft leaves, and that the short achenes and winged petioles are more constant characters than is the lobing of the leaf-blade.

B. connata, var. *typica*, is apparently widely distributed in Wisconsin.

B. connata, var. *FALLAX* (Warnst.) Sherff, Bot. Gaz. lxxvi. 154 (1923). *B. connata*, var. *fultior* Fernald & St. John, RHODORA xvii. 24 (1915). This variety, to judge from Wisconsin material, is an offshoot from var. *typica*, for its achenes do not exceed 6.5 mm. in length, the petioles are winged, and the leaves are often 3-cleft. Sherff, *l.c.*, declares that the original material of var. *fultior* has 3-cleft leaves. In Wisconsin, var. *fallax* grades into var. *typica*, although some individuals are well marked with bracts 6 cm. long. The few large irregular teeth of the leaves, mentioned both by Fernald & St. John and by Sherff, do not seem to be characteristic of most Wisconsin plants.

The range of this variety in Wisconsin is as follows: POLK Co.: quaking bog, margin of Deer Lake, St. Croix Falls, September 5, 1927, *N. C. Fassett & L. R. Wilson*, no. 4260; sunny bank of a brook, Interstate Park, St. Croix Falls, September 3, 1927, *N. C. Fassett & L. R. Wilson*, no. 4261; wet woods near Poplar Lake, St. Croix Falls, September 4, 1927, *N. C. Fassett & L. R. Wilson*, no. 4262. BUFFALO Co.: wet shore of Fountain City Slough, Fountain City, September 9, 1926, *N. C. Fassett*, no. 2976; rocky shore of the Mississippi River, Alma, August 23, 1926, *N. C. Fassett*, no. 2888; damp ground near Rohrer's Slough, Cochrane, September 7, 1926, *N. C. Fassett*, no. 2884. LACROSSE Co.: damp ground, French Id., Onalaska, August 22, 1927, *N. C. Fassett*, no. 4263.

In Minnesota, this variety has been found along the Mississippi River bottoms, opposite Alma, Wisconsin.

This plant appears to be of sporadic occurrence in southeastern Massachusetts and southern Connecticut, on Block Island, and on the estuary of the St. Lawrence River. In Wisconsin, however, it is common on the Mississippi River bottoms. We must at least consider the possibility (particularly in view of the German population of this region) that its introduction into Germany (see Sherff, *l.c.*) was not from the East, but from Wisconsin.

B. CONNATA, var. *PETIOLATA* (Nutt.) Farwell, *l.c.*, as to name-bringing synonym, but not as to plant; Fernald, *l.c.* *B. petiolata* Nutt. Journ. Acad. Nat. Sci. Phila. vii. pt. 1, 99 (1834). This plant seems best distinguished by its large achenes and wingless or narrowly margined petioles. Bordering shady pools at the State Fish Hatchery near Madison, Wisconsin, the writer found a form of this variety with ovate leaf-blades reaching 4.5 cm. in breadth, scarcely margined petioles reaching 5 cm. in length (Fig. 3), and achenes 8 mm. long. This plant is obviously var. *petiolata*, although it has campanulate heads instead of the cylindrical ones Mr. Woodward found to be characteristic of this variety in Connecticut. These plants were about 4 dm. tall. Growing with them were robust plants reaching a meter in height, with similar heads and achenes, and even larger leaves (the blades 1.8 dm. long and the slender petioles 7 cm. long) whose blades were often 2- or 3-cleft (Fig. 4). But since the pressing of one of these plants in its entirety required four or five sheets, it is obvious why these forms of var. *petiolata* with divided leaves are rare in herbaria. Again, however, the achene and petiole characters corroborate one another, although the cleaving of the leaf-blade proves somewhat inconstant. Even these shade forms, with leaves 7 cm. broad exclusive of the lobes, have petioles whose herbaceous margins barely exceed 1 mm. in breadth, or no more than that of a sun form of var. *typica* whose leaf-blade is but 1.5 cm. broad (Fig. 1). A leaf from a sun form of var. *petiolata* is shown in Fig. 5.

Collections of var. *petiolata* from different parts of Wisconsin indicate that it is of general range in the state.

B. CONNATA, var. **ambiversa**, n. var., planta 3–7 dm. alta subsimplex vel cum ramis tenuibus; foliis mediis 4–7 cm. longis cum dentibus utrinque 1–4 plerumque 3 instructis, quorum inferiores sunt saepe 1.5 cm. longi sinibus paene ad rhachem extendentibus; foliis superioribus saepe simplicibus cum dentibus grossis utrinque 1–4 instructis; bracteis exterioribus 1–3.5 cm. longis linearibus vel lanceolatis; marginibus achaeniis cum sparsis vel copiosis plerumque antrorsis setis instructibus; setis aristarum antrorsis vel retrorsis vel saepe ambobus intermixtis; achaeniis exterioribus planis 5 mm. longis 2–2.5 mm. latis, 2 aristis;

achaeniis interioribus 6–8 mm. longis cum 4 angulis ad apicem, 4 aristatis.

Plants 3–7 dm. tall, subsimple or with slender branches: middle leaves 4–7 mm. long, with 1–4, usually 3, long coarse teeth on each side, the lower often reaching 1.5 cm. in length and having a sinus reaching nearly to the midrib (Fig. 6); upper leaves usually not deeply cleft, narrowly lanceolate, with 1–4 coarse teeth on each side; outer foliaceous bracts of the involucre 1–3.5 cm. long, linear to oblanceolate: margins of achenes with sparse to copious, mostly antrorse, hairs; awns with retrorse or antrorse barbs, or commonly with both intermixed (Fig. 7); outer achenes flat, 2-awned, about 5 mm. long and 2–2.5 mm. broad; inner achenes narrowly rhomboidal in cross-section, 4-awned, 6–8 mm. long.—ASHLAND Co.: Sphagnum bog, margin of Loon Lake, Mellen, September 8, 1927, *N. C. Fassett & L. R. Wilson*, no. 5014. ONEIDA Co.: in moist kettle-hole, with copious growth of *Dulichium*, Minocqua, September 14, 1927, *N. C. Fassett*, no. 4257 (TYPE in Herb. Univ. of Wis.); Sphagnum bog, margin of Hill Lake, Minocqua, September 13, 1927, *N. C. Fassett*, no. 4258.

This variety, which is ordinarily distinguished from the next by its peculiarly cut leaves as well as by its achene character, is apparently widely distributed in the Sphagnum bogs of northern Wisconsin.

B. connata, var. *anomala* Farwell, *l.c.* Leaves 5–11 cm. long, undivided or rarely with 2 basal lobes, and with 2–8 teeth on each side: outer bracts of the involucre as in the preceding: awns and margins of achenes antrorsely barbed; achenes apparently of the same size as in the preceding. (Description made from Wisconsin material only.)—ONEIDA Co.: muddy edge of a ditch, "The Narrows," Minocqua, September 14, 1927, *N. C. Fassett*, no. 4259. LANGLADE Co.: White Lake, August 15, 1921, *J. J. Davis*.

B. connata, var. *pinnata* Wats. Gray's Manual, ed. 6: 284 (1899). Plants rather slender, 3–6 dm. tall, usually sparsely, rarely diffusely, branched; lower and middle leaves reaching 9 cm. in length, pinnately parted (Fig. 8), closely simulating those of *B. coronata* (L.) Britton (*B. trichosperma*); the lowermost divisions narrowly linear-lanceolate, rarely exceeding 5 mm. in breadth, entire, or more commonly with 1–5(–7) sharp teeth on each side coming to within 1–2 cm. of the tapering tip; base of each division narrowly decurrent on the petiole; terminal divisions with 2–8 unequal teeth on each side, which become progressively larger toward the base and often grade into the divisions; rhachis and petiole narrowly winged with the decurrent bases of the leaf-divisions: upper leaves undivided, 3–6 cm. long, with 2–10 sharp slender teeth on each side, the leaf-margins between the teeth parallel to the midrib: outer foliaceous bracts of the involucre, on well-developed heads, mostly 1–1.5 cm. long and 1.5–2 mm. broad, oblanceolate: outer achenes 4.5–5 mm. long, 3-awned; inner achenes 6–7 mm. long, 4-awned, the outer pair of awns 2–2.5 mm. long, retrorsely

barbed.—POLK Co.: sandy shore of Poplar Lake, Osceola, September 4, 1927, *N. C. Fassett & L. R. Wilson*, nos. 4016 and 4017. Also in MINNESOTA: HENNEPIN Co.: Minneapolis, July, 1878, *C. H. Herrick*. RAMSEY Co.: White Bear, August, 1890, *J. H. Sandberg*; wet places [no further locality], August, 1891, *J. H. Sandberg*; wet sandy shores [no further locality], August, 1890, *J. H. Sandberg*.

MADISON, WISCONSIN.

EXPLANATION OF PLATE 160

- Figure 1. *B. connata*, var. *typica*, leaf $\times \frac{2}{3}$.
 Figure 2. *B. connata*, var. *typica*, leaf $\times \frac{2}{3}$.
 Figure 3. *B. connata*, var. *petiolata*, leaf $\times \frac{2}{3}$.
 Figure 4. *B. connata*, var. *petiolata*, leaf $\times \frac{2}{3}$.
 Figure 5. *B. connata*, var. *petiolata*, leaf $\times \frac{2}{3}$.
 Figure 6. *B. connata*, var. *ambiversa*, leaf $\times \frac{2}{3}$.
 Figure 7. *B. connata*, var. *ambiversa*, achene $\times 2\frac{1}{2}$.
 Figure 8. *B. connata*, var. *pinnata*, leaf $\times \frac{2}{3}$.

UTRICULARIA SUBULATA IN PLYMOUTH, MASSACHUSETTS.—On September 21, 1927, Mr. H. K. Svenson and I started to investigate some of the numerous small ponds in southern Plymouth just over the Wareham line, in hopes of discovering something novel in this comparatively little worked region. The larger ponds, such as White Island Pond, yielded nothing of interest and several promising areas had been made botanically useless by the construction of cranberry bogs. Finally, however, we struck good collecting on a group of little ponds centering on Whites Pond. The discovery of such plants as *Lachnanthes tinctoria* (Walt.) Ell., *Xyris Smalliana* Nash, and *Panicum minutulum* Desv., although not constituting any extension of range is uncommon enough in this vicinity. The one noteworthy collection of the trip was *Utricularia subulata* L. forma *cleistogama* (Gray) Fernald, two small plants being found in a slough a few rods north of Whites Pond. So far as is known this is the first record in Massachusetts outside of Nantucket and Cape Cod. A little later Mr. Svenson found the *Utricularia* in fairly large numbers in shallow water on the muddy edge of Ezekiel Pond.

On October 14, we made a second trip to the southern Plymouth region, but worked more to the westward, collecting first at Fearings Pond. Here, just above the pond in the damp sand of a little spring, we found a single flowering specimen of the typical *Utricularia subulata*.—LYMAN B. SMITH, 1 Wolcott Terrace, Winchester, Mass.